

03040207-020

(Atlantic Intracoastal Waterway)

General Description

The South Carolina portion of watershed 03040207-020 (formerly 03040207-030) is located in Horry and Georgetown Counties and consists primarily of the **Atlantic Intracoastal Waterway** (AIWW) and its tributaries from Myrtle Beach northward to the North Carolina state line, and also includes streams draining into the Atlantic Ocean from the "Grand Strand" beaches southward to Litchfield Beach. The watershed occupies 71,183 acres of the Coastal Zone region of South Carolina. The predominant soil types consist of an association of the Lakeland-Newhan-Bohicket series. The erodibility of the soil (K) averages 0.16; the slope of the terrain averages 3%, with a range of 0-6%. Land use/land cover in the watershed includes: 40.4% urban land, 30.6% forested land, 10.6% forested wetland (swamp), 5.7% water, 5.4% nonforested wetland (marsh), 5.3% scrub/shrub land, 1.1% barren land, and 0.9% agricultural land.

The Little River is a tidal river and flows in both directions, from Little River Inlet to the AIWW, according to the tides. The Little River flows across the North Carolina state line and accepts drainage from Mullet Creek, Calabash Creek, Milliken Cove, and Horseford Creek. Dunn Sound Creek connects Little River Inlet to Dunn Sound, as does Sheephead Creek. Eden Saltworks Creek connects Dunn Sound to Hog Inlet, and House Creek connects Hog Inlet to Cherry Grove Inlet. Also draining into Cherry Grove Inlet are Williams Creek, Salt Flat Creek, and Nixon Creek.

The portion of the AIWW in this watershed accepts drainage from Little River Swamp, Prices Swamp, Camp Branch Run, White Point Creek (Long Pond), Long Branch, Canepatch Swamp, and Black Creek before flowing through Little River. Withers Swamp drains off of the AIWW in Myrtle Beach. Singleton Swash, Bear Creek, Canepatch Swash, Withers Swash, and Pebble Beach or Midway Swash drain directly into the Atlantic Ocean. Whale Creek, Main Creek, Woodland Creek, Parsonage Creek, Flagg Creek, Allston Creek, Oaks Creek, and Oyster Cove all drain to the ocean through Murrells Inlet. There are a total of 5.6 stream miles, 148.8 acres of lake waters, and 2,304.5 acres of estuarine areas in this watershed. All streams in the watershed are classified SFH with the exception of the AIWW. The AIWW and its tributaries from the crossing of S.C. Hwy 9 to the North Carolina state line are classified SA, and southward from the S.C. Hwy 9 crossing to the Waccamaw River are classified FW.

Water Quality

<u>Station #</u>	<u>Type</u>	<u>Class</u>	<u>Description</u>
MD-162	P	SA	LITTLE RIVER AT S END OF ISLAND DUE E OF TOWN
MD-125	S	FW/SA	AIWW (LITTLE RIVER) ON SC 9 (US 17)
MD-091	S	FW	AIWW 4 MILES N OF BRIDGE ON US 501
MD-085	S	FW	AIWW AT POINT 3 MILES NORTH OF BRIDGE ON US 501
MD-087	P	FW	AIWW JUST NORTH OF BRIDGE ON US 501

Little River (MD-162) - Aquatic life uses are not supported due to occurrences of copper in excess of the aquatic life acute standards, compounded by a high concentration of zinc measured in 1994. There is a significant increasing trend in pH. This is a tidally influenced system, characterized by naturally low pH. Although pH excursions occurred, they were typical of values seen in tidally influenced systems with significant marsh and swamp drainage and were considered natural, not standards violations. A significant decreasing trend in total nitrogen concentration suggests improving conditions for this parameter. The pesticide guthion was detected in the 1994 sediment sample. Recreational uses are fully supported, and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Atlantic Intracoastal Waterway (AIWW) - There are four monitoring sites along this section of the AIWW. A Total Maximum Daily load (TMDL) has been approved for this area. This will result in decreased loadings of oxygen demanding substances to the system (see p. 211, Watershed Protection and Restoration Strategies, for more information on the TMDL).

Aquatic life uses are partially supported at **MD-125** due to dissolved oxygen excursions. This area is transitional between freshwater and saltwater and shows characteristics of both. A significant increasing trend in dissolved oxygen suggests improving conditions for this parameter. Recreational uses are fully supported.

At **MD-091**, aquatic life uses are not supported due to dissolved oxygen excursions, compounded by a significant decreasing trend in dissolved oxygen. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Further downstream (**MD-085**), aquatic life uses are not supported due to dissolved oxygen excursions. This is a tidally influenced system, which are often characterized by naturally low pH conditions. Although pH excursions occurred, they were typical of values seen in systems with significant marsh and swamp drainage and were considered natural, not standards violations. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

At the furthest downstream site (**MD-087**), aquatic life uses are not supported due to dissolved oxygen excursions and occurrences of copper in excess of the aquatic life acute standards. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Huntington Beach State Park Pond - The pond was treated with aquatic herbicides from 1997-1999 to remove cattails and improve water quality.

A fish consumption advisory has been issued by the Department for mercury and includes the AIWW within this watershed (see advisory p.187).

NPDES Program

Active NPDES Facilities**RECEIVING STREAM****FACILITY NAME****PERMITTED FLOW @ PIPE (MGD)****COMMENT****NPDES#****TYPE****LIMITATION**

CAROLINA BAYS
 GSW&SA/VEREEN WWTP
 PIPES #: 001 FLOW: 2.5

SC0041696
 MAJOR DOMESTIC
 EFFLUENT

AIWW
 GSW&SA/VEREEN WWTP
 PIPES #: 002-005 FLOW: M/R
 WQL FOR NH3N,BOD5

SC0041696
 MAJOR DOMESTIC
 WATER QUALITY

ATLANTIC INTRACOASTAL WATERWAY
 CITY OF N. MYRTLE BEACH/OCEAN DRIVE
 PIPE #: 001 FLOW: 3.4
 WQL FOR DO,NH3N,BOD5

SC0022152
 MAJOR DOMESTIC
 WATER QUALITY

ATLANTIC INTRACOASTAL WATERWAY
 CITY OF N. MYRTLE BEACH/CRESCENT BEACH
 PIPE #: 001 FLOW: 2.1
 WQL FOR DO,NH3N,BOD5

SC0022161
 MAJOR DOMESTIC
 WATER QUALITY

ATLANTIC INTRACOASTAL WATERWAY
 CITY OF MYRTLE BEACH WTP
 PIPE #: 001 FLOW: M/R

SCG641012
 MINOR DOMESTIC
 EFFLUENT

ATLANTIC OCEAN
 USAF/MYRTLE BEACH AFB
 PIPE #: 003-005 FLOW: M/R

SC0002097
 MINOR INDUSTRIAL
 EFFLUENT

Nonpoint Source Management Program**Camp Facilities****FACILITY NAME/TYPE****RECEIVING STREAM****PERMIT #****STATUS**

BAREFOOT LANDING CAMPGROUND/FAMILY
 ATLANTIC OCEAN

26-1017
 ACTIVE

MYRTLE BEACH TRAVEL PARK/FAMILY
 ATLANTIC OCEAN

26-1021
 ACTIVE

APPACHE CAMPGROUND/FAMILY
 ATLANTIC OCEAN

26-1001
 ACTIVE

MYRTLE BEACH KOA CAMPGROUND/FAMILY
 ATLANTIC OCEAN

26-0342
 ACTIVE

SPRING MAID BEACH/FAMILY
 ATLANTIC OCEAN

26-1018
 ACTIVE

MYRTLE BEACH STATE PARK/FAMILY
 ATLANTIC OCEAN

26-1012
 ACTIVE

PIRATELAND CAMPGROUND/FAMILY ATLANTIC OCEAN	26-1014 ACTIVE
LAKEWOOD CAMPGROUND/FAMILY ATLANTIC OCEAN	26-1009 ACTIVE
OCEAN LAKES CAMPGROUND/FAMILY ATLANTIC OCEAN	26-1013 ACTIVE
HUNTINGTON STATE PARK ATLANTIC OCEAN	22-0002 ACTIVE

Land Disposal Activities

Landfill Facilities

<i>LANDFILL NAME FACILITY TYPE</i>	<i>PERMIT # STATUS</i>
CITY OF MYRTLE BEACH DUMP -----	----- CLOSED
CITY OF MYRTLE BEACH TRANSFER STA. -----	261003-6001 -----
CITY OF N. MYRTLE BEACH TRANSFER STA. -----	261004-6001 -----
VENTURE MANUFACTURING INDUSTRIAL	342433-5201 -----

Mining Activities

<i>MINING COMPANY MINE NAME</i>	<i>PERMIT # MINERAL</i>
P MINING CO. P MINING PIT	0776-51 LIMESTONE
STEVENS CONSTRUCTION COMPANY STEVENS PIT	0922-51 SAND
A.O. HARDEE & SONS, INC. SAND RIDGE	0928-51 SAND
WATERWAY ASSOC. C/O JGT, INC. WATERWAY BASIN #1	0822-51 SAND
WATERWAY ASSOC. C/O JGT, INC. WATERWAY BASIN #2	0815-51 SAND
C.L. BENTON & SONS, INC. 79TH AVE. NORTH BORROW PIT	0362-51 SAND/CLAY

Water Supply

Portions of this watershed fall within the Waccamaw Capacity Use Area and large groundwater uses must be reported (see Capacity Use Program p.23).

<i>WATER USER (TYPE) STREAM</i>	<i>REGULATED CAPACITY (MGD) PUMPING CAPACITY (MGD)</i>
CITY OF MYRTLE BEACH (M)	30.0
AIWW	40.0

Growth Potential

There is a high potential for residential/resort and commercial growth in this watershed, which contains the Cities of North Myrtle and Myrtle Beach as well as the Towns of Atlantic Beach, and Surfside Beach. This "Grand Strand" area is expected to experience a significant increase in population as the popular tourist destination lures year-round residents. Water infrastructure is located throughout the watershed, and sewerage is available in the northern tip as well as in many of the residential/resort developments on the Waccamaw Neck. All developed areas on the Waccamaw Neck will have sewer services in the near future. The closing of the Myrtle Beach Air Force Base has opened the door for additional growth in industry and commerce in the Myrtle Beach area. The City of North Myrtle Beach has an interconnection with Grand Strand Water and Sewer Authority/Wetlands projects to handle additional wastewater flows in the North Myrtle Beach area, which should encourage additional growth.

Watershed Protection and Restoration

Total Maximum Daily Loads (TMDLs)

A total maximum daily load (TMDL) for oxygen demanding substances has been developed for the main stem of the Waccamaw River and the Atlantic Intracoastal Waterway (AIWW) in watersheds 02040206-140, 03040206-150, and 03040207-020. The TMDL addresses 12 separate monitoring stations on the State's 1998 303(d) list of impaired waters. The TMDL, based on a maximum 0.1 mg/l deficit allowed in waters that do not meet applicable dissolved oxygen standards due to natural conditions, will result in a decrease of approximately 63% in the permitted oxygen demanding load discharged to the system. The decreased loadings are being implemented through the NPDES permitting system with new, more restrictive limits becoming final at the conclusion of appropriate compliance schedules.

Special Projects

Beach Monitoring Workgroup Results

The Department ceased collection of water samples in the surf zone in 1980 due to resource limitations. There were no ocean discharges of treated wastewater and other sources of ocean pollution were limited. Prior to 1980, data did not show violations of the water quality standards in the surf zone

related to stormwater discharge. A Beach Monitoring Workgroup was initiated in response to concerns of stormwater inputs in South Carolina's surf zone. Although South Carolina has limited sources of pollution to the surf, an update of surf water quality conditions was considered useful. The workgroup consisted of Department personnel and coastal municipal and county leaders. The consensus of the workgroup was that a voluntary baseline surf water quality project should be conducted in order to evaluate whether South Carolina needs to implement an ocean beach bacteria sampling program.

During the summer of 1997, coastal governments collected and analyzed 1,400 surf and stormwater samples during "dry" (3 or more days post rain event) and "wet" (within 3 hours of the first rain of 0.1 inches or more following a dry period) weather. Samples were collected in the surf at both low and high tides, and at stormwater discharges to the ocean 100 feet above and below the discharge, along with a sample every 2-3 miles of beach. The data was then submitted to the Department for evaluation to characterize the water quality of South Carolina beaches.

Beaches without stormwater outlets or swashes (Kiawah Island, Sullivans Island, Isle of Palms, Dewees Island, Pawleys Island, and unincorporated Georgetown County) did not exceed the EPA recommended geometric mean (no more than 35 enterococcus bacteria per 100 milliliters of water) in the surf during dry or wet weather conditions. Beaches exposed to discharges from swashes and/or stormwater outlets (Surfside Beach, Myrtle Beach, North Myrtle Beach, and unincorporated Horry County) did not exceed the EPA recommended geometric mean during dry weather conditions; however, wet weather effects on surf bacteria densities varied from site to site and with rainfall amount. Many wet weather surf samples exceeded the EPA example calculated single-sample limit; highest single-sample densities were associated with rainfall amounts greater than one inch. Tide stage showed no discernible effect on surf bacteria densities at any location.

The City of Myrtle Beach investigated swash and stormwater quality in conjunction with their surf monitoring. Results indicate that bacteria densities within swashes and drainage pipes are frequently higher than the EPA example calculated limit in dry weather, and consistently above this level during wet weather. Densities in Withers Swash at Ocean Boulevard in dry weather were lower at high tide than at low tide due to ocean water inflow. Stormwater inflows via swashes and drain pipes are responsible for observed high levels of bacteria in surf during wet weather.

Recommendations from the workgroup include the following: ***Do not swim or allow children to play in swashes or stormwater; in areas with swashes or stormwater outfalls, do not swim in the ocean during rainfall; educate and advise the public about the health risks of swimming; maintain a State/local partnership to regularly monitor surf in areas with beach stormwater discharges during swimming season; reduce bacteria inputs to surface waters from residences and parks; and prevent and control sources of pathogens to beaches from stormwater discharges and nonpoint sources.***

The data collected in 1999 support the posting of permanent signs at specific beach swashes and storm drain outfalls. A voluntary surf water quality monitoring program, with SCDHEC oversight, supported by local coastal municipalities and counties continues. The Department received a one-time appropriation from the S.C. General Assembly in 1999 to complement the sampling efforts of the local communities. SCDHEC has requested continued funding for this program.

In future years, it is hoped that resources will allow for weekly sampling at all stations during the months of May through September. After significant sampling has been achieved, it may be possible to make predictions about surf contamination based on trend data. This involves looking at the principal factors of rainfall amounts, outfall or swash location, tidal influences, and prevailing winds. Modeling could be effectively used to predict the areas to post, and possibly, the duration of posting. Investigations also need to be conducted to identify bacteria contributions to the stormwater.

Development & Implementation of a S.C. Coast-A-Syst

This project targets homeowners living along the Atlantic Intracoastal Waterway (AIWW) and Socastee Creek (watershed 03040206-140) and the AIWW and Little River (watershed 03040207-020). Like much of the coast, these areas are experiencing rapid development and increased populations, while also harboring fragile water resources for recreation and marine ecology. High fecal coliform bacteria counts, water quality non-supportive of aquatic life because of low dissolved oxygen, and pH excursions exist in local waterbodies.

To address these problems, the S.C. Sea Grant Consortium and Clemson University received Section 319 funds to develop and evaluate a program called South Carolina Coast-A-Syst. This product, modeled after the Home*A*Syst and Farm-A-Syst programs, will be used to teach watershed residents and waterbody users responsible practices for protecting water quality, with the ultimate goal to reduce bacteria and nutrient input into nearby waterbodies from urban/suburban activities and land development. Research will be conducted through surveys to determine what BMPs are appropriate for coastal South Carolina, where education about nonpoint source is lacking, and how best to reach homeowners in providing continued education. Education of coastal residents will include identification of practices which detrimentally affect water quality, reasons why those practices do so, and instructions in better water quality management practices.

Sea Grant Extension and Clemson Extension are publishing a S.C. Coast-A-Syst packet, which will include self-assessments and fact sheets on homeowner practices. Sea Grant Extension will also train Extension agents, Master Gardeners, and homeowner associations to administer this homestead self-assessment program, distribute the program and materials through homeowner associations and other public groups, provide support for the program through the Horry County Extension Service, and provide electronic distribution of the program via the world wide web.